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Amendment and Response

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Serial No.: 10/809,660

Confirmation No.: 7495

Filed: March 25, 2004

For: ELECTROSPRAYING APPARATUS AND METHOD FOR COATING PARTICLES**Amendments to the Claims**

This listing of claims replaces all prior versions, and listings, of claims in the above-identified application:

1-80. Canceled

81. (original) An apparatus for coating particles, the apparatus comprising:

a source comprising at least one suspension, wherein the source comprising the at least one suspension comprises at least particles and coating material;

a capillary tube electrode, wherein the capillary tube electrode includes a capillary tube having a first open end and a second open end, the capillary tube operatively connected to the source to receive a flow of at least the suspension at the first open end thereof; and

an electrode isolated from but positioned in proximity to the second open end of the capillary tube, wherein a nonuniform electrical field is created between the capillary tube electrode and the electrode isolated therefrom such that a spray of microdroplets suspending at least the particles is provided from the second end of the capillary tube, and further wherein the particles are coated with at least a portion of the coating material as the microdroplet evaporates.

82. (original) The apparatus of claim 81, wherein the particles comprise carrier particles and the coating material comprises biological material.

83. (original) The apparatus of claim 81, wherein the particles comprise biological material particles.

84. (original) The apparatus of claim 83, wherein the coating material comprises a facilitating transfer material.

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85. (original) The apparatus of claim 81, wherein an electrical charge is concentrated on the coated particles as the microdroplet evaporates, and further wherein a space charge effect of the concentrated electrical charge substantially prevents agglomeration of the coated particles.

86. (original) The apparatus of claim 85, wherein the electrical charge concentrated on a coated particle is in the range of about 80 percent to about 95 percent of a maximum charge that is held by the microdroplet.

87. (original) The apparatus of claim 81, wherein the particles have a nominal diameter of about 2 nanometers to about 1 micron.

88. (original) The apparatus of claim 87, wherein the particles have a nominal diameter of about 10 nanometers to about 100 nanometers.

89. (original) The apparatus of claim 81, wherein the particle source provides a continuous source of the suspension to the capillary tube.

90. (original) The apparatus of claim 81, wherein the capillary tube electrode further comprises a casing concentric with at least a portion of the capillary tube between the first and second open ends thereof, the second open end of the capillary tube extending beyond the casing a predetermined distance, and further wherein the apparatus includes a gas source providing a gas to be received between the capillary tube and the concentric casing.

91. (original) An apparatus for coating particles, the apparatus comprising:
a particle source comprising at least particles to be coated;
a coating material source comprising at least coating material;

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a capillary tube electrode having a dispensing tip, wherein the capillary tube electrode includes:

a first capillary tube having a first open end and a second open end, the first capillary tube operatively connected to receive a flow of at least one of particles and coating material at the first open end thereof, and

a second capillary tube concentric with at least a portion of the first capillary tube, wherein at least one of the particles and the coating material is received in an annular opening defined between the first and second concentric capillary tubes; and

an electrode isolated from but positioned in proximity to the dispensing tip of the capillary tube electrode, wherein a nonuniform electrical field is created between the capillary tube electrode and the electrode such that a spray of microdroplets suspending at least particles is provided from the dispensing tip, and further wherein upon evaporation of the microdroplets the particles are coated with the coating material.

92. (original) The apparatus of claim 91, wherein the capillary tube electrode further includes a casing concentric with at least a portion of the second capillary tube between a first and second open end thereof, the second open end of the second capillary tube extending beyond the casing a predetermined distance, and further wherein the apparatus includes a gas source providing a gas to be received between the second capillary tube and the concentric casing.

93. (original) The apparatus of claim 91, wherein an electrical charge is concentrated on the coated particles as the microdroplet evaporates, and further wherein a space charge effect of the concentrated electrical charge substantially prevents agglomeration of the coated particles.

94. (original) The apparatus of claim 93, wherein the electrical charge concentrated on a coated particle is in the range of about 80 percent to about 95 percent of a maximum charge that is held by the microdroplet.

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95. (original) The apparatus of claim 91, wherein the particles have a nominal diameter of about 2 nanometers to about 1 micron.
96. (original) The apparatus of claim 95, wherein the particles have a nominal diameter of about 10 nanometers to about 100 nanometers.
97. (original) The apparatus of claim 91, wherein the particle source comprises at least one suspension comprising biological material particles.
98. (original) The apparatus of claim 91, wherein the particle source comprises biological material particles.
99. (Currently Amended) The apparatus of claim 91, wherein the coating material comprises a facilitating transfer material. [[71.]]